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(54) NEAR INFRARED RAY ABSORBING FILM

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a near infrared ray absorbing film, for cutting off near infrared ray irradiation from a plasma display panel or the like, having absorption in the near infrared ray region, having high transmittance in the visible ray region, also in the case of using a plurality of near infrared ray absorbents having little interaction between them and having excellent durability.

SOLUTION: The near infrared ray absorbing film is provided in which at least two near infrared ray absorbing layers showing absorption in 800-1,100 nm near infrared wavelength region are formed on a substrate and which consists in total of at least three layers including the substrate. A plurality of the near infrared ray absorbing layers are optionally arranged separately on both sides of the substrate or optionally laminated with a plurality of the layers on one surface of the substrate. It is preferable to make one of the near infrared ray absorbing layers contain a pigment showing absorption at a wavelength in 900-1,100 nm and to make another near infrared ray absorbing layer contain a pigment showing absorption at a wavelength in 800-900 nm. Furthermore, it is more preferable to combine a diimmonium type pigment and a fluorine containing phthalocyanine type pigment.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention] This invention relates to the translucency film which absorbs efficiently the near infrared ray generated from a plasma display panel (PDP) etc.
[0002]
[Description of the Prior Art] Although it displays using the luminescence accompanying a discharge in gases, it follows on a discharge in gases, and a plasma display panel is the wavelength of 800-1,100nm. Since a neighboring near infrared ray is emitted, there is a possibility of causing incorrect actuation in peripheral devices, such as remote control equipment. Therefore, the front guard plate which has a near infrared ray shield mechanism is usually used for a plasma display panel. In order to give a near infrared ray shield mechanism, the approach and near infrared ray absorptivity coloring matter which scour for example, near infrared ray absorptivity coloring matter to a base material are applied on a film, and the approach of sticking it on a base material etc. is adopted.
[0003] For example, publication number 11 No. -249576 official report and publication number Binder resin is made to distribute two or more kinds of coloring matter which contains G MONIUMU system coloring matter in 11 No. -326631 official report, and the approach of intercepting the near infrared ray emitted from a plasma display panel is proposed using the infrared absorption filter applied on the transparence base material.
[0004]
[Problem(s) to be Solved by the Invention] However, when G MONIUMU system coloring matter was used in the condition of near infrared ray absorptivity ability having deteriorated, for example, having mixed with strong polar phthalocyanine system coloring matter when the matter which has a polar group was touched, the manifestation of sufficient near infrared ray absorptivity ability might become difficult.

[0005] Then, this invention persons found out that the effect of two or more coloring matter was almost lost by [which show absorption to a near infrared region] preparing two-layer on a base material at least, as a result of repeating research for the purpose of lessening effect of mutual and moreover attaining sufficient near infrared ray absorptivity ability, even when at least two kinds of coloring matter with which absorption properties differ is used. By specifically preparing the near infrared ray absorption layer containing G MONIUMU system coloring matter, and the near infrared ray absorption layer containing other near infrared ray absorptivity coloring matter on a base material, respectively, also in various durability tests, G MONIUMU system coloring matter adds various examination, such as a header and combining a base material and a binder appropriately further, for holding the outstanding near infrared ray absorptivity ability, and came to complete this invention.
[0006] Therefore, one of the purposes of this invention is to offer [to lessen effect of mutual, even when two or more near infrared ray absorbers are used, and] the near infrared ray absorptivity film which moreover demonstrates sufficient near infrared ray absorbing power. Another purpose of this invention shows absorption to a near infrared ray wavelength field, and its permeability of a visible region is high,

and it is to offer a near infrared ray absorptivity film with good endurance.
[0007]
[Means for Solving the Problem] namely, this invention -- wavelength of 800-1,100nm at least the two-layer near infrared ray absorption layer which shows absorption to a near infrared region -- having -- a base material -- including -- the sum total -- even if few, the near infrared ray absorptivity film which consists of three layers is offered.
[0008] The near infrared ray absorption layer which consists of transparence resin with which the coloring matter which has near infrared ray absorbing power was distributed is more specifically prepared in the transparence resin film more than two-layer, and one near infrared ray absorption layer is the wavelength of 900-1,100nm. The coloring matter which shows absorption to a near infrared region is contained, and the near infrared ray absorptivity film with which another near infrared ray absorption layer contains the coloring matter which shows absorption to a near infrared region with a wavelength of 800-900nm is offered. Moreover, from another standpoint, the near infrared ray absorption layer which consists of transparence resin with which the coloring matter which has near infrared ray absorbing power was distributed is prepared in the transparence resin film more than two-layer, one near infrared ray absorption layer contains the coloring matter which consists of a G MONIUMU system compound, and the near infrared ray absorptivity film containing the coloring matter with which another near infrared ray absorption layer consists of a phthalocyanine system compound is also offered.
[0009]
[Embodiment of the Invention] Hereafter, the near infrared ray absorptivity film of this invention is further explained to a detail. the near infrared ray absorptivity film specified from the largest standpoint in this invention -- a base material layer -- including -- the sum total -- even if few, it consists of three layers and at least two-layer becomes a near infrared region from the near infrared ray absorption layer of them which shows absorption. Therefore, the near infrared ray absorption layer this film indicates absorption to be to specific wavelength was formed on two or more kinds and a transparence base material.
[0010] As a transparence base material layer, generally a resin film is used and Pori (meta) acrylic ester system resin, polycarbonate system resin, polyester system resin, triacetyl cellulose system resin, polystyrene system resin, polyolefine system resin, etc. are mentioned as an example of concrete resin. Especially in these, Pori (meta) acrylic ester system resin, polycarbonate system resin, polyester system resin, or triacetyl cellulose system resin is used preferably. These films are manufactured by the general shaping approaches, such as for example, the T-die fabricating method and the solvent cast method, and surface treatment, such as ****** processing, could be easy to be performed.
[0011] A near infrared ray absorption layer is the wavelength of 800-1,100nm. It is the layer which shows absorption to the near infrared region of a between, and the coloring matter which shows absorption to a near infrared region is usually used for formation of this layer. As such near infrared ray absorptivity coloring matter, permeability is high to the light and what absorbs many light of a near infrared region is desirable. Specifically, the near infrared ray absorbent of a G MONIUMU system near infrared ray absorbent, an aminium system near infrared ray absorbent, an anthraquinone system near infrared ray absorbent, a phthalocyanine system, especially a fluorine-containing phthalocyanine system, a nickel complex system near infrared ray absorbent, a poly methine system near infrared ray absorbent, a diphenylmethane system near infrared ray absorbent, a triphenylmethane color system near infrared ray absorbent, etc. are mentioned. It is good to combine two or more kinds from these inside.
[0012] In the form distributed in the binder, these near infrared ray absorptivity coloring matter can be used as a near infrared ray absorption layer, and prepares at least two layers of such near infrared ray absorption layers in this invention. It can also prepare one layer of near infrared ray absorption layers of these plurality at a time in both sides of a transparence base material, and a laminating can be carried out to one side of a transparence base material more than two-layer, and they can also be prepared in it. Of course, while preparing a near infrared ray absorption layer in both sides of a transparence base material, it is also possible to make the near infrared ray absorption layer of the field of one side or both into plurality if needed. When carrying out the laminating of two or more near infrared ray absorption layers

to one side, in case the laminating of a bilayer eye or subsequent ones is carried out, it is desirable to choose the class of a solvent or binder suitably so that mixing by the interface may not take place. Moreover, a barrier layer can also be prepared between each class. As a binder which distributes near infrared ray absorptivity coloring matter, resin is usually used, for example, the polyester system resin of Pori (meta) acrylic ester system resin, aliphatic series, or aromatic series, melamine resin, urethane resin, polycarbonate resin, polyolefine system resin, polystyrene system resin, etc. are mentioned. Especially, Pori (meta) acrylic ester system resin is desirable.

[0013] Although especially the amount of the near infrared ray absorptivity coloring matter used is not necessarily limited, its range of 0.1 - 50 weight section extent is desirable to the solid content 100 weight section of binder resin. When the amount of coloring matter is made [many / not much], although near infrared ray absorptivity ability becomes good, it is in the inclination for the permeability of the light to fall. Moreover, although the permeability of the light will become good if there are not much few amounts of coloring matter, sufficient near infrared ray absorptivity ability is no longer obtained.

[0014] In preparing the near infrared ray absorption layer of the form where near infrared ray absorptivity coloring matter was distributed in the binder, on a base material, it is not necessarily limited especially, but for example, an organic solvent can be made to be able to dissolve or distribute coloring matter and binder resin, coating liquid can be prepared, and the approach of applying this on a base material can be adopted. As an organic solvent used here, an aliphatic hydrocarbon system solvent, an aromatic hydrocarbon system solvent, alcoholic solvent, ketone solvent, ester solvent, an ether system solvent, etc. can be mentioned, it is independent, respectively, or two or more sorts can be mixed by request, and these can be used, for example.

[0015] Moreover, various additives, such as an ultraviolet ray absorbent, an anti-oxidant, a thermostabilizer, and a leveling agent, can be added to the coating liquid containing coloring matter and binder resin if needed. Furthermore, a hue is also controllable by adding a general toning color.

[0016] When forming a near infrared ray absorption layer by spreading of the coating liquid containing coloring matter and binder resin, as for desiccation thickness, it is desirable that it is in the range of about 0.1-50 micrometers. When this thickness is not much small and thickness is [applying by uniform thickness becomes difficult and] not much large, depending on the class of base material, it may curl greatly.

[0017] Although at least two layers of such near infrared ray absorption layers are prepared in this invention, as for at least two-layer, it is desirable among the near infrared ray absorption layers of these plurality that the absorption greatest on different wavelength is shown. For that purpose, what is necessary is just to combine at least two kinds of near infrared ray absorptivity coloring matter with which the wavelength which shows the greatest absorption differs. Specifically, one near infrared ray absorption layer is 900-1,100nm. The coloring matter which shows absorption to the wavelength of a between is contained, and, as for another near infrared ray absorption layer, it is desirable to contain the coloring matter which shows absorption to the wavelength between 800-900nm. In the near infrared ray absorptivity coloring matter illustrated previously, G MONIUMU system coloring matter and aminium system coloring matter are 900-1,100nm, for example. Absorption is shown in the wavelength of a between and anthraquinone system coloring matter, phthalocyanine system coloring matter, nickel complex system coloring matter, poly methine system coloring matter, etc. show absorption to the wavelength between 800-900nm. therefore -- among these -- since -- it is good to combine two or more kinds, and it can also use diphenylmethane system coloring matter and triphenylmethane dye depending on the case. Especially, the combination of G MONIUMU system coloring matter, and phthalocyanine system coloring matter, especially fluorine-containing phthalocyanine system coloring matter is desirable.

[0018] Furthermore, the configuration which prepares the resin layer by which G MONIUMU system near infrared ray absorption coloring matter was distributed on the base material, and the resin layer by which phthalocyanine system near infrared ray absorption coloring matter was distributed in according to, respectively is much more desirable. When this mixes both and it uses, where the resin layer formed

on the film depending on the class of binder or the structure of coloring matter may discolor, and near infrared ray absorptivity ability may fall and both are mixed further, when it is kept under a room temperature, it is also for being certain for the near infrared ray absorptivity ability of G MONIUMU system coloring matter to fall, and to lead to reduction in pot life. A G MONIUMU layer and a phthalocyanine layer may be formed in both sides of a base material, respectively, and may carry out the laminating of both the layers to one side. In case the laminating of a bilayer eye or subsequent ones is carried out, it is desirable to choose the class of a solvent or binder so that mixing by the interface may not take place, and it can also prepare a barrier layer between each class, as it mentioned above, when the laminating of both the layers was carried out to one side.

[0019] "IRG-022" by Nippon Kayaku Co., Ltd., "IRG-040", "CIR-1081" by Japan Carlit Co., Ltd., etc. are specifically as G MONIUMU system coloring matter mentioned. Although for example, Pori (meta) acrylic ester system resin, polyester system resin, etc. are suitable for the binder resin used for distributing G MONIUMU system coloring matter, Pori (meta) acrylic ester system resin is especially desirable. Since the solution containing G MONIUMU system coloring matter and acrylic binder resin can obtain by the trade name of "RAS-24-02" from Japan Carlit Co., Ltd., it can also use this. The amount of the G MONIUMU system coloring matter used, the formation approach of the near infrared ray absorption layer containing it, its thickness, etc. are the same as the contents which explained the general near infrared ray absorption layer previously.

[0020] moreover -- as phthalocyanine system coloring matter -- concrete -- for example, Co., Ltd. -- NIPPON SHOKUBAI -- "IR-1" which makes the "IEKU scalar" of make a words preceding the title generally disregarded in cataloging, "IR-2", "802K", "810K", "812K", etc. are mentioned. These coloring matter is independent, respectively, or can be used combining two or more kinds if needed. As binder resin for distributing phthalocyanine system coloring matter, the polyester system resin of the Pori (meta) acrylic ester system resin illustrated previously, aliphatic series, or aromatic series, melamine resin, urethane resin, polycarbonate resin, polyolefine system resin, polystyrene system resin, etc. are usable. The amount of the phthalocyanine system coloring matter used, the formation approach of the near infrared ray absorption layer containing it, its thickness, etc. are the same as the contents which explained the general near infrared ray absorption layer previously.

[0021] The near infrared ray absorptivity film of this invention obtained as mentioned above has the high permeability of a visible region, and becomes what has the low permeability of a near infrared region. Light permeability, especially the permeability in the wavelength of about 450-650nm are specifically 60% or more in general, and it is the wavelength of 800-1,100nm. The permeability of the near infrared ray field of extent is 30% or less and the wavelength of 850-1,100nm. It is desirable that the permeability of a between is 10% or less. Since a screen will become dark when it uses for the front plate of a display if light transmission becomes small, when it is not desirable and the transmission of a near infrared ray field becomes large, it becomes impossible to demonstrate sufficient near infrared ray shield mechanism. An example of spectral transmittance distribution of the near infrared ray absorptivity film by this invention is shown in drawing 1 . Wavelength of 900-1,100nm The near infrared ray absorption layer containing the coloring matter in which absorption is shown in between, The near infrared ray absorption layer containing the coloring matter in which absorption is shown with a wavelength of 800-900nm in between separate more specifically, respectively By making the near infrared ray absorption layer of a G MONIUMU system and a phthalocyanine system form on a base material separately, respectively, endurance is good, moreover, the permeability of a visible region is high and a near infrared ray absorptivity film with the small permeability of an intravital ultraviolet range can be obtained.

[0022]

[Example] Hereafter, although an example explains this invention in more detail, this invention is not restricted at all by these examples. In addition, especially % and the section in the following examples are weight criteria unless it refuses. Moreover, evaluation was performed by the following approaches.

[0023] (1) optical engine-performance each sample -- JIS Z 8701 the stimulus value Y in an XYZ color system -- and -- JISZ 8729 Color coordinate b* in a L*a*b* color coordinate system It asked.

[0024] (2) The spectral transmittance of the range of 300-1,500nm wavelength was measured about light transmission each sample using the Shimadzu spectrophotometer "UV-3100." And the value with a wavelength [of 850nm] and a spectral transmittance of 1,000nm was read and displayed.
[0025] (3) Perform the exposure test of 250 hours at the resistance-to-moist-heat temperature of 60 degrees C, and 90% of relative humidity, and it is light transmission change and b* of the near infrared ray field after a trial. The following criteria estimated from the value change.
Near-infrared-ray permeability O: For the increment in near infrared ray permeability, the increment in less than 3% and x:near infrared ray permeability is 3% or more.
Discoloration Degree O: b* A value change is less than 3 and x:b*. A value change is three or more.
[0026] (4) Perform the exposure test of 250 hours under desiccation with a heat-resistant temperature of 80 degrees C, and it is light transmission change and b* of the near infrared ray field after a trial. The following criteria estimated from the value change.
Near-infrared-ray permeability O: For the increment in near infrared ray permeability, the increment in less than 3% and x:near infrared ray permeability is 3% or more.
Discoloration Degree O: b* A value change is less than 3 and x:b*. A value change is three or more.
[0027] 0.125mm in thickness after dilute the G MONIUMU system coloring matter content solution "RAS-24-02" (acrylic binder resin be include) by example 1 Japan Carlit Co., Ltd. with toluene and make it 13% of solid content concentration on the impact-proof acrylic film ["theque NOROI" by Sumitomo Chemical Co., Ltd.], coating be carried out so that the thickness after desiccation might be set to about 3 micrometers in the bar coating machine of No.16.
[0028] Next, instead of the G MONIUMU system coloring matter in "RAS-24-02" "IEKU scalar 810K" which is fluorine-containing phthalocyanine system coloring matter by NIPPON SHOKUBAI Co., Ltd., and "IEKU scalar 812K" And the 2.4 sections add and it dilutes with toluene further. respectively -- the binder solid content 100 section -- receiving -- the 8.4 sections -- After considering as the phthalocyanine system coating of 9.5% of solid content concentration, coating was carried out to the field where the G MONIUMU system pigment layer of the above-mentioned impact-proof acrylic film is opposite to the field by which coating was carried out so that the thickness after desiccation might be set to about 2 micrometers in the bar coating machine of No.16. The evaluation result after a moisture-proof heat trial and a heat test is shown in Table 1 at the initial engine performance of the obtained double-sided coating film, and a list.
[0029] As example 2 base material, the double-sided coating film was created on the same conditions as an example 1 except having used the polycarbonate film [the "panlight" by Teijin, Ltd.]. The evaluation result after a moisture-proof heat trial and a heat test is shown in Table 1 at the initial engine performance of the obtained film, and a list.
[0030] On the same conditions as being shown in example 3 example 1, coating was carried out to one side of an acrylic film at the order of a phthalocyanine system pigment layer and a G MONIUMU system pigment layer. The evaluation result after a moisture-proof heat trial and a heat test is shown in Table 1 at the initial engine performance of the obtained film, and a list.
[0031] Coating was carried out on the same conditions as an example 3 except having replaced example 4 base material with the non-saponified triacetyl cellulose film ["Konica TAC/UV-SF" by Konica Corp.]. The evaluation result after a moisture-proof heat trial and a heat test is shown in Table 1 at the initial engine performance of the obtained film, and a list.
[0032] G MONIUMU system coloring matter by example 5 Nippon Kayaku Co., Ltd. "IRG-022", After the 8.4 sections added to the resin solid content 100 section of the acrylic binder resin solution "AKURIDIKKU 56-1155" by Dainippon Ink & Chemicals, Inc., it diluted with weight ratio 1 / 1 mixed solvent of toluene/methyl ethyl ketone, and was made 13% of solid content concentration. About this liquid, the thickness after desiccation is about 3 micrometers at the bar coating machine of No.16 to one side of the polyethylene terephthalate film "lumiler" by Toray Industries, Inc. The thickness after desiccation is about 2 micrometers about the same phthalocyanine system coating as having carried out coating so that it might become, and having prepared on still more nearly another one side in the second half of an example 1. Coating was carried out so that it might become. The evaluation result after a

moisture-proof heat trial and a heat test is shown in Table 1 at the initial engine performance of the obtained film, and a list.

[0033] The same fluorine-containing phthalocyanine system coloring matter "IEKU scalar 810K" and "IEKU scalar 812K" as having used in the example 1 were diluted with the 5.6 sections and 1.6 ******, and toluene to the resin solid content 100 section of the same G MONIUMU system coloring matter content solution "RAS-24-02" as having used in the example of comparison 1 example 1, respectively, and it was made 12% of solid content concentration. [same] On the same non-saponified triacetyl cellulose film as having used this liquid in the example 4, coating was carried out so that the thickness after desiccation might be set to about 3 micrometers in the bar coating machine of No.16. The evaluation result after a moisture-proof heat trial and a heat test is shown in Table 1 at the initial engine performance of the obtained film, and a list.

[0034] Dissolve the polyester system binder "Byron 200" by example of comparison 2 Toyobo Co., Ltd. in weight ratio 1 / 1 mixed solvent of toluene/methyl ethyl ketone, and the resin solid content 100 section is received. The G MONIUMU system coloring matter "IRG-022" by Nippon Kayaku Co., Ltd., the fluorine-containing phthalocyanine system coloring matter "IEKU scalar 810K" by NIPPON SHOKUBAI Co., Ltd., and the fluorine-containing phthalocyanine system coloring matter "IEKU scalar 812K" by NIPPON SHOKUBAI Co., Ltd., respectively The 8.3 sections, It added at a rate of the 6.1 sections and the 1.8 sections, it diluted with weight ratio 1 / 1 mixed solvent of toluene/methyl ethyl ketone further, and considered as 13% of solid content concentration. The thickness after desiccation is about 3 micrometers at the bar coating machine of No.16 on the same acrylic film as having used this liquid in the example 1. Coating was carried out so that it might become. The evaluation result after a moisture-proof heat trial and a heat test is shown in Table 1 at the initial engine performance of the obtained film, and a list.

[0035] The G MONIUMU system coloring matter by example of comparison 3 Nippon Kayaku Co., Ltd. "IRG-022", The phthalocyanine system coloring matter "IEKU scalar 810K" by NIPPON SHOKUBAI Co., Ltd., and the phthalocyanine system coloring matter "IEKU scalar 812K" by NIPPON SHOKUBAI Co., Ltd. As opposed to the resin solid content 100 section of the acrylic binder resin solution "AKURIDIKKU 56-1155" by Dainippon Ink & Chemicals, Inc. It added at a rate of the 8.3 sections, the 6.1 sections, and the 1.8 sections, respectively, this liquid was diluted with weight ratio 1 / 1 mixed solvent of toluene/methyl ethyl ketone, and it considered as 13% of solid content concentration. Coating was carried out so that the thickness after drying the above-mentioned coating liquid by the bar coating machine of No.16 to the easily-adhesive side of the easily-adhesive polyethylene terephthalate film "KOSUMOSHAIN A4100" by Toyobo Co., Ltd. might be set to about 3 micrometers. The evaluation result after a moisture-proof heat trial and a heat test is shown in Table 1 at the initial engine performance of the obtained film, and a list.

[0036]

[Table 1]

	初期性能				耐湿熱性			耐熱性		
	光学性能		近赤外線透過率		近赤外線透過率		変色	近赤外線透過率		変色
	Y値	b*	850 nm	1000 nm	850 nm	1000 nm		850 nm	1000 nm	
実施例1	69%	3.15	9.34%	3.64%	○	○	○	○	○	○
〃 2	66%	3.48	3.68%	2.86%	○	○	○	○	○	○
〃 3	70%	3.21	5.38%	4.26%	○	○	○	○	○	○
〃 4	71%	2.64	8.52%	4.63%	○	○	○	○	○	○
〃 5	66%	3.98	3.61%	2.98%	○	○	○	○	○	○
比較例1	66%	3.27	4.15%	4.63%	○	×	×	○	×	×
〃 2	67%	5.62	4.10%	2.80%	○	×	×	○	×	×
〃 3	65%	4.39	2.84%	2.31%	○	○	×	○	○	×

[0037]
[Effect of the Invention] The near infrared ray absorptivity film of this invention is prepared on a base material by using different near infrared ray absorptivity coloring matter as a separate layer, and it becomes the thing excellent in endurance ability while its permeability of a visible region is high and it holds the engine performance in which the permeability of a near infrared region is low, by this. For this reason, this near infrared ray absorptivity film is very useful as near infrared ray shielding layers, such as a front-face guard plate of a plasma display panel.

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CLAIMS

[Claim(s)]
[Claim 1] at least the two-layer near infrared ray absorption layer which shows absorption to the near infrared region of a between with a wavelength of 800-1,100nm, respectively -- having -- a base material -- including -- the sum total -- the near infrared ray absorptivity film characterized by consisting of three layers even if few.
[Claim 2] The near infrared ray absorptivity film according to claim 1 whose two-layer near infrared ray absorption layer is a layer which contains near infrared ray absorptivity coloring matter, respectively even if this ** cannot be found.
[Claim 3] The near infrared ray absorptivity film according to claim 2 with which the two-layer near infrared ray absorption layer is formed in both sides of a transparence base material, respectively in the form where near infrared ray absorptivity coloring matter was distributed in the binder even if this ** cannot be found.
[Claim 4] The near infrared ray absorptivity film according to claim 2 with which the laminating of the two-layer near infrared ray absorption layer is carried out to one side of a transparence base material more than two-layer in the form where near infrared ray absorptivity coloring matter was distributed in the binder, respectively even if this ** cannot be found.
[Claim 5] One near infrared ray absorption layer is the wavelength of 900-1,100nm. Near infrared ray absorptivity film according to claim 3 or 4 with which the coloring matter in which absorption is shown in between is contained, and another near infrared ray absorption layer contains the coloring matter in which absorption is shown with a wavelength of 800-900nm in between.
[Claim 6] The near infrared ray absorptivity film according to claim 3 or 4 which contains the coloring matter with which one near infrared ray absorption layer consists of G MONIUMU system compounds, and contains the coloring matter with which another near infrared ray absorption layer consists of a phthalocyanine system compound.
[Claim 7] The near infrared ray absorptivity film according to claim 3 to 6 whose binder is Pori (meta) acrylic ester system resin.

[Translation done.]